vigorously to the heart of the matter, the mystery of normal perception. Parapsychologists should number neurophysiologists, neurologists, neurosurgeons and psychopharmacologists among their allies. Penfield[7] has given us many clues about the brain as a storehouse of images. Sir Russell Brain[1] reminds us that it is still very difficult to imagine how we perceive anything, and indeed advances in neurophysiology seem to be making this harder to understand. He writes, "Thus when we perceive a two-dimensional circle we do so by means of an activity in the brain which is halved, reduplicated, transposed, distorted and three-dimensional. If physiological idealism is to be really physiological, it must admit that its theory of projection breaks down because the circle which is said to be projected from the cerebral cortex never existed there at all."

Sherrington[8] writing a decade ago discussed perception in a striking passage:

"It is not therefore a physiological conjunction in space but a temporal conjunction in 'mental space'. It is not spatial conjunction of cerebral mechanism which combines them. Identity in time and perceptual space suffice. It instances the 'now' as an integrating factor of the finite mind. It is much as though the right and left eye images were seen each by one of two observers and the minds of the two observers were combined to a single mind. It is as though the right eye and left eye perceptions are elaborated singly and then psychically combined to one. The synthesis is a mental one in which the finite mind uses time as a synthesizer. . . . In all this there is no evidence that the mind-brain correlation requires in any of these combinings the brain to provide spatial conjunction of the two component processes. All that is wanted is concurrence in time. . . . It is as if each eye had a separate sensorium of considerable dignity proper to itself, in which mental processes based on that eye were developed up to even full perceptual level. Such would amount physiologically to a visual sub-brain. There would be two such sub-brains, one for the right eye and one for the left. Contemporaneity of action rather than structural union seems to provide their mental collaboration."

To a great neurophysiologist, a famous neurosurgeon and an eminent neurologist the relationship between mind and brain is still obscure. In such a context the findings of parapsychology need not strain our credulity, and, no longer an offence against nature, become pertinent reflections of the infinite strangeness at the core of our being. In medicine we can be particularly open to the unusual—to paraphrase Terence, "I am a physician, I reckon nothing human indifferent to me." H.O.

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THE CAUSE OF STROKES

VASCULAR disease of the nervous system, besides accounting for about 14% of all deaths in England and Wales, causes much incapacity not only in old age but in the prime of life as well. In one series of 200 patients with cerebrovascular disease, 25% were below the age of 50. These vascular accidents have been regarded as unpredictable, inevitable and untreatable, but this fatalistic attitude is giving way in the face of surgical advances in the treatment of such lesions as subdural hematoma, subarachnoid hemorrhage from an aneurysm or angioma, and cerebral ischemia due to narrowing or occlusion of an internal carotid artery.

Successful treatment in this field is more than ordinarily dependent on correct diagnosis. The fallibility of unaided clinical diagnosis was apparent in the experience of a large neurological department in London where 80 consecutive cases of strokes were investigated by arteriography. In 11 patients in whom occlusion of the internal carotid had been diagnosed, the presence of this lesion was confirmed in four, and such occlusions were found in 10 further cases in which this diagnosis had not been made clinically. Occlusion of the middle cerebral artery was diagnosed clinically in 37 patients but confirmed in only two; of the remaining 35 patients, six were shown to have occlusion of the internal carotid artery, two had intracerebral hemorrhage, and the angiogram was within normal limits in 27.

Carotid arteriography, despite its imprecision, is a valuable aid in detecting extracerebral lesions with considerable accuracy. However, arterial occlusion can be diagnosed with certainty only when it involves large vessels, and often intracerebral hemorrhages cannot be recognized by this procedure. A single angiogram is negative in 60% of strokes and is a procedure that carries a definite risk. In autopsy studies in cases where death has been attributed to cerebrovascular disease, stenosis is commonly observed in the vertebral arteries as well as the internal carotids.

In one recently reported study, Dickinson and Thomson[1] found a close correlation between the blood pressure and the *reduction* in the fluid-carrying capacity of the carotid and vertebral arteries: the higher the blood pressure, the lower was the capacity of these arteries. The lowest capacities of all were found in patients with strokes. These workers found no difference between cases of cerebral hemorrhage and cerebral infarction and concluded that both conditions develop on a similar background of cerebral ischemia.

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Low-Beer and Phear[2] have shown that cerebral infarction, like cerebral hemorrhage, is associated with hypertension. In their study of 109 cases of cerebral infarction, proved at autopsy, the mean blood pressure before the stroke was in the region of 200/110 mm. Hg, and in two-thirds of these cases the blood pressure did not fall at the time of the stroke.

The factors predisposing to either of these accidents, on the same background of cerebral ischemia, are unknown, but acute lowering of the blood pressure does predispose to infarction. This type of lesion commonly occurs during sleep when the blood pressure is at its lowest.

A leading article in a recent issue of *Lancet*[3] draws attention to the extracerebral rather than the intracerebral arteries and to the entire cerebral circulation rather than the artery supplying the affected part. There is no direct correlation between the site of the lesion and the artery in the neck in which the greatest degree of narrowing exists. This suggests that the circle of Willis usually remains an effective anastomosis even when advanced arterial disease is present. Such disease is usually greatest at the origin of the internal carotid and the vertebral arteries and is due to narrowing by atheroma, with the occasional superimposition of old or recent thrombosis. Surgical reconstructive therapy in such cases is directed to the improvement of the blood flow through the circle of Willis, and where both the carotid and vertebral arteries are stenosed, a good clinical result may follow correction of the carotid obstruction. However, surgical therapy rarely dispels established symptoms, and results are best in patients with transient and intermittent symptoms.

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THE TEEN-AGE DRIVER AND TRAFFIC SAFETY

THE serious hazard posed by the mounting toll of traffic accidents is a direct concern of the medical profession in Canada. This problem is under intensive study by Committees on the Medical Aspects of Traffic Accidents appointed by The Canadian Medical Association and several of its Divisions. The interest of organized medicine in this field is evidenced by the continuous activity of these committees and by a steady flow of recent publications on this subject.

Available statistics indicate impressively that drivers in their teens and early twenties constitute a vulnerable age group that is particularly prone to involvement in traffic accidents. Intensive efforts are being concentrated toward the improvement of driver safety among members of this age group in many centres throughout the North American continent. One of the many avenues of approach in this campaign involves the education of young and recently licensed drivers particularly from the viewpoint of attitudes, motivation, courtesy to others on the road, and plain common sense.

In this regard a recent contribution offered as a public service by the Metropolitan Life Insurance Company in the form of a slim, 15-page booklet entitled "How To Be a Better Teen-Age Driver", is worthy of note.

Copies of this pamphlet may be obtained free of charge from agents or district offices of the Metropolitan Life Insurance Company or from the Company's Canadian Head Office at 180 Wellington Street, Ottawa, Ontario. Educationalists, government bodies, traffic officials and other groups who are now engaged in active programs in the area of driver training may find this publication of value in their efforts to indoctrinate the fundamental principles of traffic safety and courtesy in Canada's drivers of tomorrow.

SEAT BELTS AND TRAFFIC ACCIDENTS

The Canadian Highway Safety Council has recently launched a campaign to encourage the installation and use of seat belts in all motor vehicles.

It is no doubt quite obvious to the medical profession in Canada why such a program should be introduced. During the report of the C.M.A.'s Committee on the Medical Aspects of Traffic Accidents, at our 94th Annual Meeting last June, those of us present were shocked to hear that in 1960 there were a quarter of a million accidents on Canadian highways. This statement was more startling when it was revealed that over 3000 people were killed, and 90,000 were injured.

Medical interest in combating this serious health problem should be accelerated to an even greater degree than it is at the present time. As a member of the Canadian Highway Safety Council, The Canadian Medical Association fully endorses their current drive to encourage the use of seat belts. As individuals we too have an excellent opportunity to support the C.H.S.C. in their worthwhile effort to save lives.

It is my firm belief that the use of seat belts by all occupants of motor vehicles will substantially reduce loss of life and injury.

G. W. HALPENNY, M.D., *President, The Canadian Medical Association*